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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/061,126	01/30/2002	Arnold Kholodenko	6089P1/CALB/ECP/PJS	2260
32588	7590	10/13/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			ZHENG, LOIS L	
			ART UNIT	PAPER NUMBER
			1742	
DATE MAILED: 10/13/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/061,126

Applicant(s)

KHOLODENKO, ARNOLD

Examiner

Lois Zheng

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 37-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 37-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 12 July, 2004 has been entered.

Status of Claims

2. Claims 1-17 are amended in view of the amendment filed on 12 July, 2004.

Claims 18-36 are canceled in view of the amendment.

New claims 37-40 are added in view of the amendment.

Therefore, claims 1-17 and 37-40 remain for examination.

Status of Previous Rejections

3. The double patenting rejections of claims 1-17 are withdrawn in view of Applicant's filing of a terminal disclaimer on 17 May 2004.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

Art Unit: 1742

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-17 and 37-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended claims 1, 9 and 17 presented in the amendment filed on 12 July, 2004 claim a semiconductor processing apparatus for electro-chemical deposition on a semiconductor substrate. However, the original specification (except "BACKGROUND OF THE INVENTION") only discloses an electro-chemical deposition apparatus on a substrate. The concepts of a semiconductor processing apparatus and a semiconductor substrate are not supported by the instant invention disclosed in the specification. Therefore, the scope of claims 1, 9 and 17 is no longer consistent with the original scope of the specification, which constitutes new matter under 35 U.S.C. 132 or MPEP601.01. Claims 2-8,10-16 and 37-38 are also rejected since they depend on claim 1 or claim 9.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been

Art Unit: 1742

obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-5, 7-13, 15-17 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/54920(WO '920) in view of Miller et al. US 4,801,865 (Miller).

The 35 U.S.C. 103(a) rejection of claims 1, 3-5, 7-9, 11-13 and 15-17 as set forth in the previous Final Office Action has been **maintained** as is incorporated herein.

Claims 2 and 10 are rejected since the metal impregnated elastomer ring is annular in nature.

Claims 37 and 38 are rejected for the same reason as rejections of claims 4 and 12 since the cylindrical posts of claims 4 and 12 would also read on general posts of claims 37 and 38.

8. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '920 in view of Miller et al. US 4,801,865 (Miller) as applied to claims 1-5, 7-13, 15-17 and 37-38 above, and further in view of Dordi et al. US 6,635,157(Dordi).

The teachings of WO '920 and Miller are discussed in the previous Final Office Action.

However, WO '920 in view of Miller does not teach the contact pin being comprised of platinum or platinum alloy.

Dordi teaches a cathode contact ring for electro-chemical deposition (title, abstract) in which the contact pads comprises platinum(col. 11, lines 64-67).

Art Unit: 1742

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated platinum as the contact pad material of Dordi into the contact pin material of WO '920 in view of Miller in order to minimize oxidation on the contact pad as taught by Dordi(col. 11, lines 64-67).

9. Claims 1-2, 7, 9-10, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crafts et al. US 5,807,469(Crafts) in view of Miller.

The 35 U.S.C. 103(a) rejections of claims 1-2, 7, 9-10, 15 and 17 as set forth in the previous Final Office Action has been **maintained** and incorporated herein.

10. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crafts in view of Miller as applied to claims 1-2, 7, 9-10, 15 and 17 above, and further in view of Dordi.

The teachings of Crafts and Miller are discussed in the previous Final Office Action.

However, Crafts in view of Miller does not teach the contact pin being comprised of platinum or platinum alloy.

Dordi teaches a cathode contact ring for electro-chemical deposition (title, abstract) in which the contact pads comprises platinum(col. 11, lines 64-67).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated platinum as the contact pad material of Dordi into the contact pin material of Crafts in view of Miller in order to minimize oxidation on the contact pad as taught by Dordi(col. 11, lines 64-67).

Art Unit: 1742

11. Claims 1-17 and 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dordi in view of Miller, and further in view of WO '920.

Dordi teaches an electro-chemical deposition system comprising:

- An annular conductive body in a processing apparatus(col. 3, line 59 – col. 4 line 3, figures 7-10 and 18) adapted to support the substrate and having at least one contact pad receiving pocket formed therein(col. 10, line 61-col. 11, line 4, col.11-lines 25-30, figures 7-10 and 18).
- The contact pads are adapted to electrically bias the substrate proximate the substrate's perimeter(col. 11, lines 35-41).
- The contact pad is an annular ring(col. 11, lines 5-8, figures 7-10 and 18).
- The contact pad is a plurality of arc segments(Figures 8-9).
- The conductive body further comprises a first surface, a substrate support surface supporting the electrical contact pin thereon and a shoulder that connects the first surface and the substrate support surface(col.11, lines 8-15, figures 7-10).
- The contact pad is comprised of platinum(col. 11, lines 64-67, col. 14 lines 42-44).
- A dielectric covering at least partially encapsulating the conductive body(col.11, lines 5-11, figures 7-10).
- A portion extending from the conductive body and having a contact surface free from the dielectric covering(figures 7-10, 772).

Art Unit: 1742

- A first seal of the contact pin providing a seal with the conductive body(col. 12 line 45 – col. 13 line 20, figures 8-10, 782)

Dordi further teaches that the contact pad may have different shapes(col. 12. lines 37-39). Therefore, the term “contact pin” in independent claims 1,9 and 17 is being given its broadest possible meaning, which would read on the contact mechanism embodiments described in figures 9 and 18. In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed.Cir. 1989)

However, even though the contact pins of Dordi are rigidly affixed to the conductive body, Dordi does not specifically teaching the brazing of the contact pins. In addition, Dordi does not specifically teach that the processing cell is a semiconductor processing apparatus and the metal substrate is a semiconductor substrate. Furthermore, Dordi does not specifically teach the contact pin is a plurality of posts such as cylindrical posts.

Miller teaches that the application of contact pins by brazing would result in a more continuous bond(see previous Final Office Action).

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the contact pins by brazing as taught by Miller into the contact ring of Dordi in order to improve the continuity of the bond as taught by Miller(See previous Final Office Action).

WO '920 teaches that an electro-chemical deposition cell can be used to electroplating semiconductor substrates(title, abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to have used the electro-chemical processing apparatus of Dordi in view of Miller to electroplate semiconductor substrates as taught by WO '920.

WO '920 also teaches using metal wires(i.e. cylindrical posts) as contact pins to conduct electrical power from the cathode clamp ring to the substrate(page 15, lines 15-20).

Therefore, it would have been obvious to one of ordinary skill in the art to have used cylindrical post shaped metal wires of WO'920 as contact pins of the conductive ring of Dordi in view of Miller in light of the teachings of Dordi disclosing that the contact pins maybe of different shapes.

12. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dordi in view of Miller.

The teachings of Dordi and Miller are discussed in paragraph 11 above.

Dordi further teaches that conductive body and the contact pins are made from different metals(col.11 lines 58-67). The processing cell of Dordi further comprises an anode assembly(col. 19, lines 48-56, figure 6, 474) in a processing kit(figure 6, 420) and the electroplating solution connects the anode and plating the surface of the substrate(col. 16 lines 54-61).

However, even though the contact pins of Dordi are rigidly affixed to the conductive body, Dordi does not specifically teaching the brazing of the contact pins.

The claimed limitation would have been obvious to one skilled in the art by Dordi in view of Miller for the same reason as stated in paragraph 11.

Response to Arguments

13. Applicants's arguments filed 12 July 2004 have been fully considered but they are not persuasive.

14. In the remarks, applicants argued that a skilled artisan would not be motivated to combine the teachings WO '920 and Miller because:

- a. Miller is not analogous prior art, and
- b. The metal wires of WO '920 are not rigidly affixing to the cathode clamp ring and WO'920 teaches away from brazing a portion of a pin in a receiving pocket.

15. In response to applicants's arguments (a) and (b) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, Miller is pertinent to making of the contact pin. A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. See MPEP 2141.01(a).

Art Unit: 1742

Furthermore, WO'920 discloses in "BACKGROUND OF THE INVENTION" a cathode ring comprises a plurality of contact pins(page 3, lines 12-13). It is well settled that omission of an element and its function is obvious if the function of the element is not desired. Please see MPEP 2144.04 II(A). Ex parte Wu, 10 USPQ 2031(Bd. Pat. App. & Inter. 1989), In re Larson, 340 F.2d 965, 144 USPQ 347 (CCPA 1965).

In this case, since a cathode ring comprising a plurality of contact pins is known in the art, it would have been obvious to one skilled in the art to have omitted the sliding metal wires feature in the elastomer ring of WO '920 if the risk of scratching the substrate deposition surface is of no concern, and therefore, the sliding metal wires would not be a desired feature.

16. In the remarks, applicants argued that a skilled artisan would not be motivated to combine the teachings Crafts and Miller because:

- c. Miller is not analogous prior art,
- d. Crafts teaches away from providing conductance between cathode contact devices and a cup or a base of a cup that the cathode contact devices are mounted on, and
- e. The cup or the base of the cup are not conductive bodies.

17. In response to applicants's arguments (c), (d) and (e) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge

Art Unit: 1742

generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, Miller is pertinent to making of the contact pin. A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. See MPEP 2141.01(a).

Furthermore, applicants' arguments (b) and (c) are irrelevant since the conductive contact ring with arms(i.e. contact pins) provides the support surface to the semiconductor substrate(Figure 6).

18. In the remarks, applicants argued that the references, either alone or in combination, fail to teach, show or suggest an apparatus for electro-chemical deposition a substrate as recited in the new claims 39 and 40.

19. The rejection ground for the new claims 39 and 40 is given in paragraph 12 above.

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Stevens EP 1,101,780 teaches a cathode contact ring for electro-chemical deposition.

Art Unit: 1742

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

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